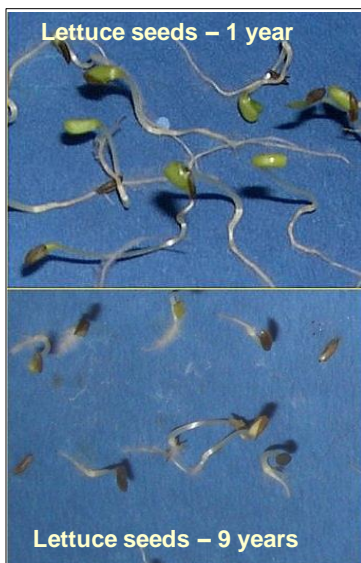


Long-term Viability of Seeds in Genebanks: High impact but also High Cost and Uncertainty

How long can seeds survive during storage?

Seed longevity (i.e., quality) affects

- monitoring & regeneration frequencies
- genetic shifts resulting from genebanking
- seed industry risks from carry-over and declining value of high-cost seed

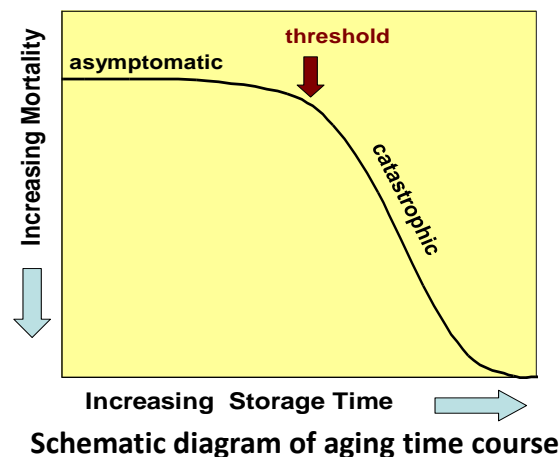


Germination tests are currently the only means to describe seed viability. They constitute a major operating cost for NCGRP, have no predictive value and consume high-value seeds. Moreover, germination results reveal little about when accessions should be regenerated to minimize genetic shifts.

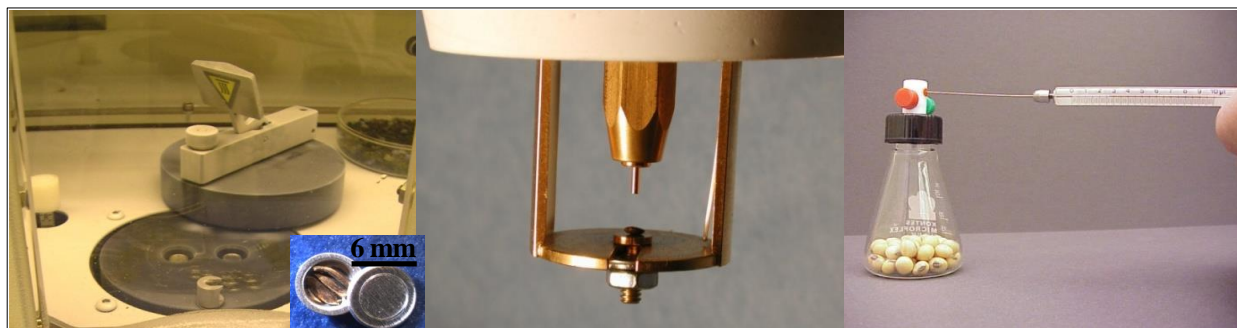
Germination assays of a lettuce cultivar stored in the refrigerator for different durations.



Soybeans are a relatively short-lived seed.



Applying work from diverse disciplines, PGPRU is developing biomarkers that predict when the threshold for rapid deterioration will occur and to non-invasively detect changes during the early stages of seed aging when there are no symptoms. These new tools are based on concepts of visco-elastic properties.



Biomarkers that measure thermal properties of seed oils (DSC), mechanical properties of seed (DMA) and volatiles emitted from seeds (GC) as indicators of seed longevity